

Taxonomic status of *Pieris (napi) nesis* Fruhstorfer, 1909 (Lepidoptera, Pieridae)

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Abstract The androconia of the lectotype specimen of *Pieris napi nesis* Fruhstorfer, 1909, deposited in NHM London (BMNH), are examined in order to confirm its taxonomic status. *Pieris nesis* is shown to be from Honshu (Yamato-sujiguroshirochou in Japanese) and closely related to *Pieris napi* (Linnaeus). The synonymy of *P. nesis* and *P. melete* Ménéttriès, 1857, as previously indicated by Warren (1961) and Tadokoro (2015), is rejected. *Pieris napi japonica* Shirôzu, 1952 is considered a junior synonym of *Pieris nesis* due to the year of priority (syn. nov.).

Key words Androconia, Ezo-sujiguroshirochou, Japan, *Pieris japonica*, *Pieris melete*, *Pieris nesis*, *Pieris napi*-group, Systematics, Taxonomy, Yamato-sujiguroshirochou.

Introduction

There are three distinct species of the *Pieris napi*-group in Japan, *Pieris melete* and two *napi*-related species, one from Hokkaido and the other from Honshu. The taxon *Pieris (napi) nesis* Fruhstorfer, 1909 has been treated by different authors as the *napi*-related species either from Hokkaido (Ezo- sujiguroshirochou) or from Honshu (Yamato- sujiguroshirochou). The confusion has been caused by the conflict between the type locality, stated as Sapporo/Hokkaido in Fruhstorfer (1909), and the wing markings of the lectotype specimen in NHM, which suggested Yamato-sujiguroshirochou from Honshu. Recently, Tadokoro (2015) suspected that *P. (napi) nesis* might be *Pieris melete* from Hokkaido as previously indicated by Warren (1961). Warren included the taxon *nesis* in the *melete*-group instead of the *napi*-group (*napi*-related species group) based on the form of its androconia. Furthermore, two handwritten labels, [megamera] and [andr. bm 37 S. R. B.] attached to the lectotype specimen, indicate that the specimen could be *P. melete*. In fact, *P. melete* from Hokkaido resembles the *napi*-related species from Honshu (Yamato-sujiguroshirochou) in wing markings, and only detailed examination of the androconia can reliably separate them morphologically. As Tadokoro (2015) confirmed that the wing markings of the lectotype specimens perfectly matched the original description of Fruhstorfer (1909), the taxonomic status of *Pieris (napi) nesis* can only be determined if the androconia of the lectotype specimen are examined. The lectotype specimen was selected by Eitschberger (1983), designated by him as the ‘holotype’ from Fruhstorfer’s 4 (2 ♂, 2 ♀) syntypes, while a female specimen was named as ‘Allotype’. The author believes that the above treatment in Eitschberger (1983) complies

with the Article 74 of ICZN for the designation of the lectotype and paralectotype.

Eitschberger (1983) also revised the type locality of *Pieris nesis* from Sapporo/Hokkaido to North Honshu, only after reviewing both Fruhstorfer (1909) and the type specimens.

Materials and methods

NHM (BMNH) generously agreed to loan the lectotype specimen of *P. (napi) nesis* “BMNH #141802” (Fig. 1) to the Museum of Nature and Human Activities, Institute of Natural and Environmental Sciences, University of

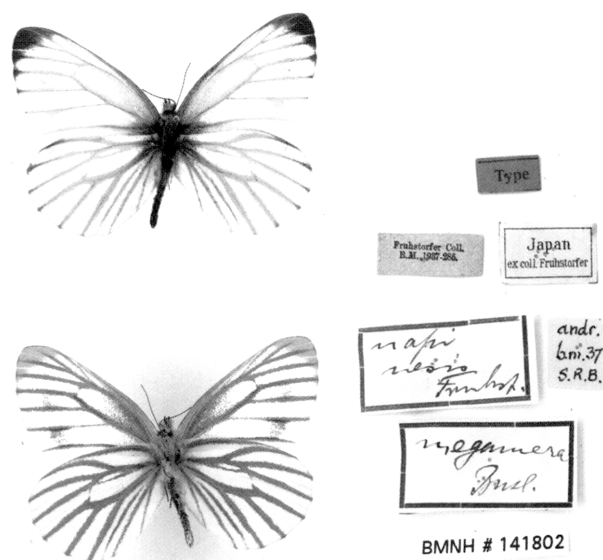


Fig. 1. Lectotype specimen of *Pieris (napi) nesis* ♂ © NHM.

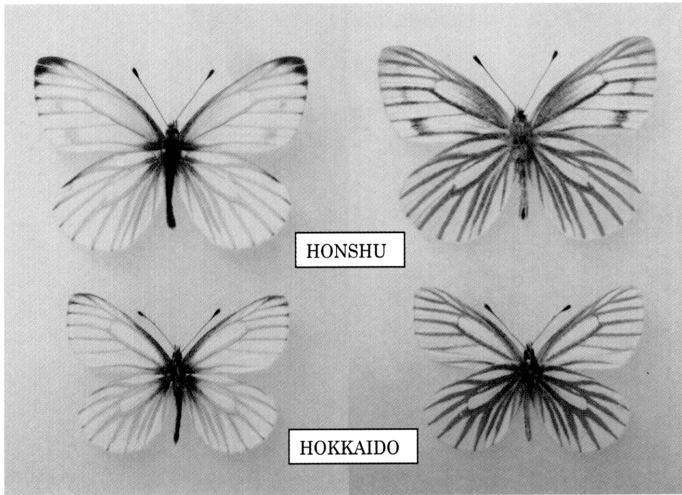


Fig. 2. The *napi*-related species ♂ from Honshu and Hokkaido (First brood).

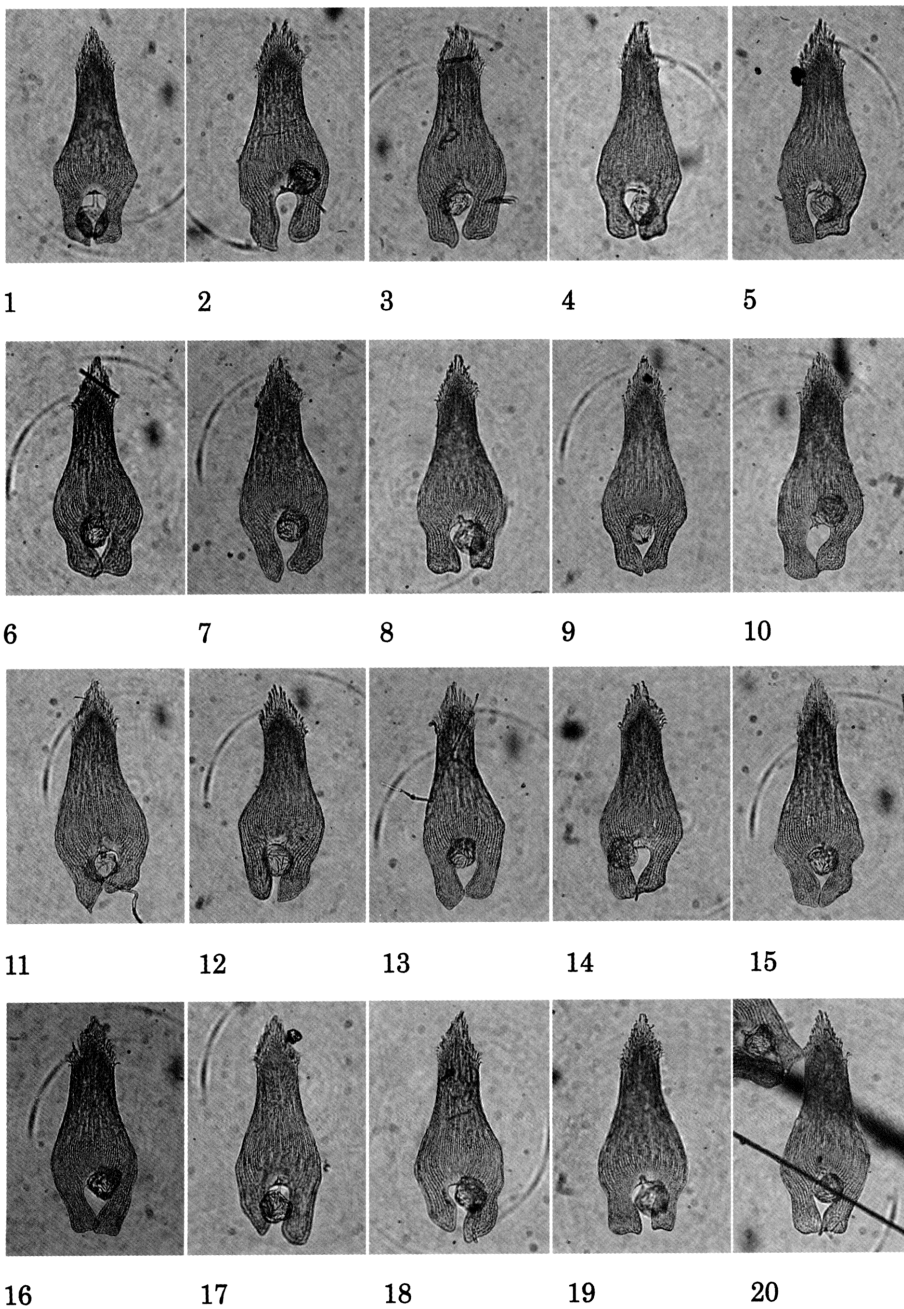


Fig. 3. Androconia of *Pieris (napi) nesis*
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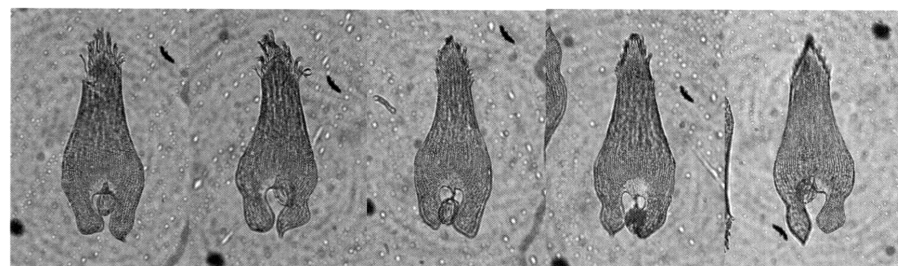
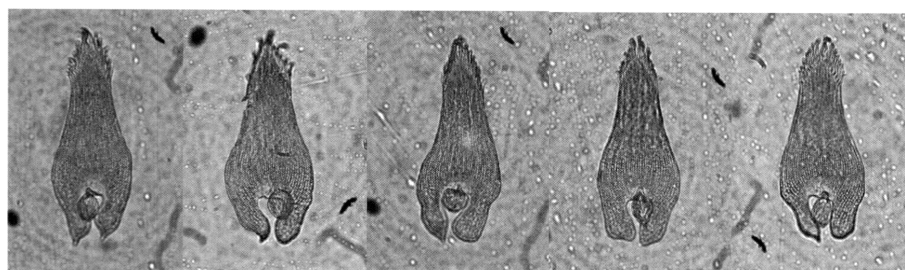
Hyogo in Japan, during the period from middle of March to September 2015, for the author's inspection. A specimen of the *napi*-related species from Honshu was collected at Takayama-shi in Gifu prefecture on 23 V 2009, and of the one from Hokkaido at Kamikawa-gun Wassamu-cho on 20 V 2012 (Fig. 2). The androconia of the lectotype of *P. (napi) nesis* were examined by the author in the presence of Dr Takeo Yamauchi, a researcher of the Museum of Nature and Human Activities. The androconia were removed from the forewing upperside of all the specimens and observed by optical microscope of 400 magnifications. A P-plate of the androconia of *P. (napi) nesis* has been returned to NHM for future reference.

Results and discussion

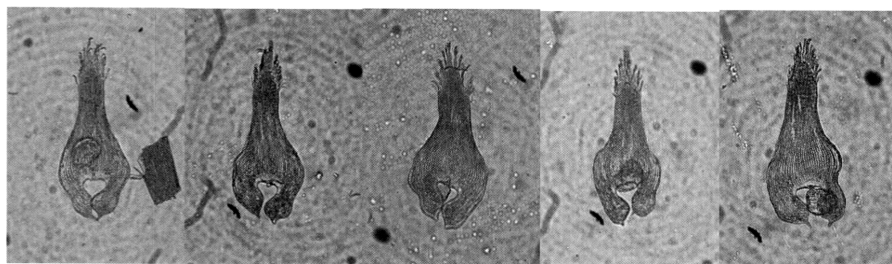
The androconia extracted from the lectotype specimen of *P. (napi) nesis* are shown in Figure 3, and the ones extracted from the *napi*-related species in the first brood are shown in Figure 4.

[Androconia]

As Warren (1961), Fujimori (2012) and Tadokoro *et al.* (2013) indicated, *Pieris melete* can easily be distinguished from *Pieris napi* or *napi*-related species by the form of the androconia. The androconia in *P. melete* have the largest scent cell within the *Pieris napi*-group, almost double the size of the ones in *Pieris napi*-related species



Honshu (First brood)



Hokkaido (First brood)

Fig. 4. Androconia of the *napi*-related species from Honshu and Hokkaido (First brood).

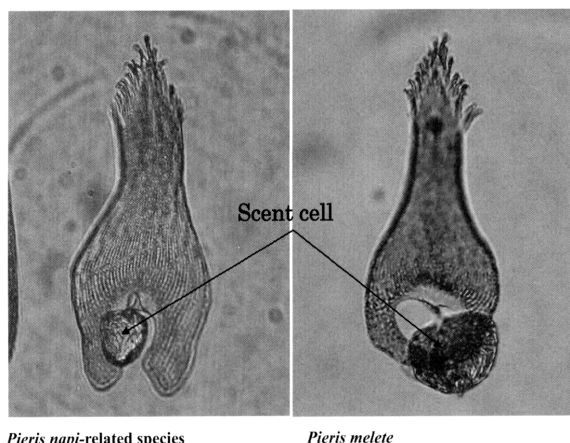


Fig. 5. Androconia of *P. melete* and *P. napi* related species.

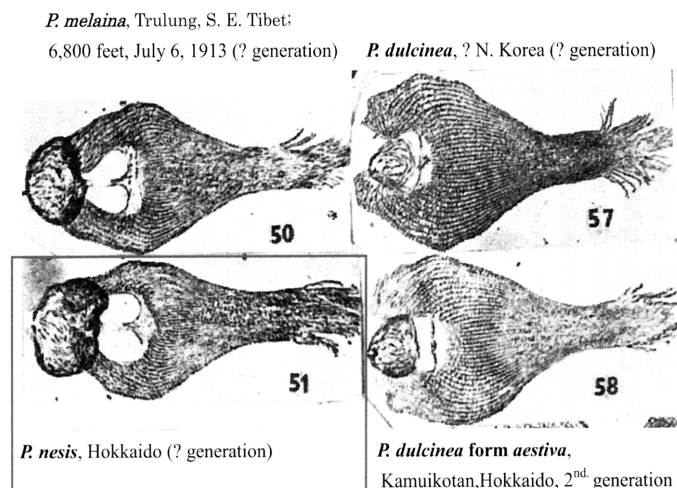


Fig. 6. Androconia of *P. nesis* and other species [After Warren (1961)].

(Fig. 5). The androconia extracted from the lectotype specimen of *P. (napi) nesis* (Fig. 3) have the typical form of *napi*-related species rather than of *P. melete*.

Furthermore, detailed examination of these androconia shows that:

1. The lamina is generally broad, which indicates that the specimen is probably the first brood as indicated by Warren (1961), Fujimori (2012) and Tadokoro *et al.* (2013).
2. The neck width is gradually tapered from the bottom to the top and the shoulder is not angled, which, according to Nishikai (2010), indicates that the specimen is probably from Honshu instead of Hokkaido (Figs 3 & 4).

[Wing markings]

As indicated by Tadokoro (2015), the wing markings of *Pieris nesis* described in Fruhstorfer (1909) perfectly match the lectotype specimen, and also match both *Pieris melete* and the *napi*-related species from Honshu, but do not match the *napi*-related species from Hokkaido in its normal form. The wing markings suggest that the lectotype specimen of *Pieris nesis* is conspecific with the *napi*-related species from Honshu (Figs 1 & 2).

Conclusion

Judging from the form of androconia and wing markings, *Pieris nesis* is indicated as the first brood of the *Pieris napi*-related species “Yamato- sujiguroshirochou” from Honshu. This was previously suggested by Eitschberger (1983). Additionally, I determine that *Pieris japonica* Shirôzu, 1952 becomes a junior synonym of *Pieris nesis* due to the year of priority.

Conflicts:

The above conclusion is suggesting that:

1. The type locality of *Pieris nesis* was not Sapporo, but somewhere in Honshu.
2. The specimen of *Pieris nesis* that Warren (1961) inspected (Fig. 6) was not the lectotype specimen.
3. The label [megamera] was a misidentification, and the label [andr. bm 37 S. R. B.] was nothing to do with Warren (1961) (Fig. 1).

Acknowledgments

Special thanks to Dr Blanca Huertas of NHM (BMNH) in London, who agreed to loan the lectotype specimen of *Pieris (napi) nesis* to Japan for inspection, and to Dr Takeo Yamauchi of the Museum of Nature and Human Activities, Institute of Natural and Environmental Sciences, University of Hyogo for his kind coordination with NHM and great help during the inspection. I also express my sincere appreciation to my friend Dr Ulf Eitschberger for his great works.

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摘 要

*Pieris (napi) nesis*の分類上の位置づけ (田所輝夫)

Pieris (napi) nesis は、研究者によって北海道産のエゾスジグロシロチョウとして扱われたり、本州産のヤマトスジグロシロチョウとして扱われたりまちまちである。さらにTadokoro (2015) はWarren (1961)の発香鱗研究の結果 (Fig. 6) から「*Pieris (napi) nesis*が実はナピ種群ではなく北海道産のスジグロシロチョウではないか」と推論した。著者はそれらを検証する為にロンドン自然史博物館 (旧: 大英博物館) に保管されている*P. (napi) nesis*のレクトタイプ標本 (Fig. 1) [Eitschberger (1983) により担名タイプである「ホロタイプ」(レクトタイプの誤用と解釈できる) に指定された♂個体で、著者はこの処置によりレクトタイプ指定が正しく行われたと考える]の発香鱗を検鏡することにした。ナピ種とスジグロシロチョウの発香鱗は簡単に区別できる (Fig. 5)。著者の要望を受けて*P. (napi) nesis*のレクトタイプ標本は「兵庫県立人と自然の博物館: 兵庫県立大学自然・環境科学 研究所」に貸し出された。著者が検鏡した結果、発香鱗の形態に以下の特徴が見られた (Fig 3):

1. 香囊のサイズはスジグロシロチョウのように大きくなく、ナ

ピ種群のものである。

2. ラミナ (発香鱗から香囊を除いた部分) は全体的に幅広く第一化 (春型) である事が推察される。
3. ラミナの形状では、頸部の太さが下にいくに従って徐々に広がり肩が張っていない。西海 (2010) の研究結果では本州産のヤマトスジグロシロチョウの特徴と一致する。なお、西海 (2010) の研究結果は夏型個体を対象としているが、著者の知見では春型個体の発香鱗においても同様な傾向が見られる (Fig. 4)。

一方、田所 (2015) によると、原記載文に示された*P. (napi) nesis*の斑紋はスジグロシロチョウ若しくは本州産ヤマトスジグロシロチョウに合致し、正常型の北海道産のナピ種には合致しないことが判っている (Figs 1 & 2)。以上の考察から、*P. napi nesis*はTadokoro (2015) が推論した北海道産のスジグロシロチョウではなく、Eitschberger (1984) が分類した通り本州産のヤマトスジグロシロチョウであることが示唆された。それにより、これまで曖昧であった以下の点が明確になった。

1. *P. napi nesis*の基産地は札幌ではなく本州であった。
2. Warren (1961)が検鏡した*P. napi nesis*はレクトタイプ標本ではなかった (Fig. 6)。
3. タイプ標本のラベル[megamera]は誤同定, [andr. bm 37 S. R. B.]はWarren (1961)と無関係。

なお、*Pieris japonica* Shirôzu, 1952は記載年により*Pieris (napi) nesis*のシノニムとなって姿を消す。本州産のナピ種 (ヤマトスジグロシロチョウ) を示す学名は、今後*Pieris nesis*を使用するのが適当である。

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